WHAT WE CLAIM ARE:

1. A semiconductor device comprising:

a gate electrode formed over a partial surface area of a semiconductor substrate, with a gate insulating film being interposed therebetween;

first semiconductor films made of semiconductor material and formed over surfaces of the semiconductor substrate on both sides of the gate electrode, each of the first semiconductor films being spaced apart from the gate electrode by a distance;

impurity diffusion regions formed in each of the first semiconductor films;

extension regions formed in surface layers of the semiconductor substrate on both sides of the gate electrode, each of the extension regions being doped with impurities of a same conductivity type as the impurity diffusion region and being connected to a corresponding one of the impurity diffusion regions; and

Sidewall spacers made of insulating material and formed on sidewalls of the gate electrode, the sidewall spacers extending beyond borders of the first semiconductor films on the gate electrode side and covering partial surfaces of the first semiconductor films.

2. A semiconductor device according to claim 1, further comprising:

a first metal silicide film formed on surfaces of the first semiconductor films not covered with the side wall spacers; and

a second metal silicide film formed on the gate electrode.

3. A method of manufacturing a semiconductor device, comprising steps of:

(a) forming a gate insulating film and a gate electrode disposed on the gate insulating film, over a partial surface of a semiconductor substrate;

(b) forming first sidewall spacers on sidewalls of the gate electrode;

(c) growing first semiconductor films made of semiconductor material over surfaces of the semiconductor substrate not covered with the gate electrode and the first sidewall spacers;

(d) removing the first sidewall spacers;

(e) implanting impurities of a first conductivity type into a surface layer of the semiconductor substrate and surface layers of the first semiconductor films, by using the gate electrode as a mask;

(f) forming second sidewall spacers on the sidewalls of the gate electrode, the second sidewall spacers reaching at least edges of the first semiconductor films on the gate electrode side;

(g) implanting impurities of the first conductivity type into regions of the first semiconductor films not covered with the second side wall spacers; and

(h) executing heat treatment for activating the impurities implanted at the steps (e) and (g).

4. A method of manufacturing a semiconductor device according to claim 3, further comprising a step of executing a silicidation reaction and forming a metal silicide film on surfaces of the first semiconductor films not covered with the second side wall spacers and on an upper surface of the gate electrode, the step being executed after the step (h).

5. A method of manufacturing a semiconductor device according to claim 3, wherein in the step (f), the second side wall spacers are formed, the second side wall spacers extending edges of the first semiconductor films on the gate electrode side and covering partial surfaces of the first semiconductor films.

6. A method of manufacturing a semiconductor device according to claim 4, wherein in the step (f), the second side wall spacers are formed, the second side wall spacers extending edges of the first semiconductor films on the gate electrode side and covering partial surfaces of the first semiconductor films.

7. A method of manufacturing a semiconductor device according to claim 3, wherein in the step (g), the impurities are implanted under a condition that after the heat treatment in the step (h), the impurities remain at least in partial regions of the first semiconductor films on the gate electrode side without being diffused into the semiconductor substrate.

8. A method of manufacturing a semiconductor device according to claim 4, wherein in the step (g), the impurities are implanted under a condition that after the heat treatment in the step (h), the impurities remain at least in partial regions of the first semiconductor films on the gate electrode side without being diffused into the semiconductor substrate.

9. A method of manufacturing a semiconductor device according to claim 5, wherein in the step (g), the impurities are implanted under a condition that after

the heat treatment in the step (h), the impurities remain at least in partial regions of the first semiconductor films on the gate electrode side without being diffused into the semiconductor substrate.